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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,385	04/01/2004	Feng-Wen Sun	PD-203051	9374
20/991 7590 05/25/2010 THE DIRECTV GROUP, INC. PATENT DOCKET ADMINISTRATION CA / LA1 / A109 2230 E. IMPERIAL HIGHWAY EL SEGUNDO, CA 90245				
EXAMINER				
HAILU, KIBROM T				
ART UNIT		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/816,385

**Applicant(s)**

SUN ET AL.

**Examiner**

KIBROM T. HAILU

**Art Unit**

2461

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21, 50 and 51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21, 50 and 51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. Applicant's arguments filed February 24, 2010 have been fully considered but they are not persuasive because the cited references disclose the claimed limitations as set forth in the previous office action.

The arguments on page 9 to 11 of the Remarks are not persuasive, and thus the claims are not patentable in view of the following disclosure.

First, since the Examiner reopened the prosecution by introducing new references, there is no point in addressing the Applicants' previous arguments because the newly cited references disclose the argued limitations. As to the Applicants' assertion that Christodoulides doesn't disclose "mapping" a codeword specifying framing information of a frame according to a signal constellation to output a data stream, the Examiner respectfully disagrees because Christodoulides explicitly discloses the same. Reading col. 5, lines 43-48 and 56-68, one can clearly understand that Christodoulides describes the claim limitation. That is, the unique word indicating about the frame and type is mapped onto the QAM constellation.

The Applicants argue that the Examiner's rational for combining the references is misguided and inoperable, and Christodoulides achieves frame synchronization and there would no motivation to apply the approach of the Applicants to the system of Christodoulides, but instead a teaching away of the claimed invention. Well, the Examiner respectfully disagrees.

Regarding the rational for combining the references is misguided and inoperable, the motivation to combine the references doesn't have to be the same as the Applicants' as long as the references do not teach against any synchronization. Recalling the previous arguments, the

Applicants argued that Christodoulides doesn't disclose de-multiplexing the data stream into first and second data stream. However, Mowbray clearly teaches De-multiplexing the data stream into first and second stream (e.g. see fig. 1). De-multiplexing the data stream would reduce the time of overhead for error detection or checksum, which in turn improves the communication speed of the system. Since this is done in parallel, there is not effect on synchronization. In fact, synchronization would be facilitated.

Regarding Miyoshi, the reference clearly teaches duplicating the original data stream (see, figs. 1 and 19; col. 2, lines 43-67; col. 4, line 56-col. 5, line 6). Combining the duplicating step of Miyoshi with Christodoulides and Mowbray would improve the efficiency of transmission and quality of the reception as it reduces the frequency of retransmission that would otherwise result in high error rate.

Raleigh also discloses the step of modifying the first data stream according a predetermined operation and multiplexing the modified stream with the second data stream (please see Fig. 2; col. 4, lines 61-64; col. 4, line 65-col. 5, line 1). Incorporating Raleigh's modifying and multiplexing of the first data stream into the above references would reduce decoding errors at the receiving side because additional information about decoding is sent by modifying the data stream.

As per the argument of teaching away from of the claimed invention, the Examiner respectfully disagrees because, said above, any of the above references do not teach against any synchronization. In fact, by modifying Christodoulides using the above references, one of ordinary skill in the art would come up to the Applicants' invention so that supporting for frame synchronization would be achieved as claimed.

Therefore, the Applicants' arguments are persuasive and the claimed invention is not patentable in view of the cited references and the above responses to the arguments.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1-2, 4, 9-10, 11-13, 15, 20-21 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides et al. (US 6,665,361 B1) in view of Mowbray et al. (US 6,119,263), and further in view of Miyoshi et al. (US 7,372,908 B2) and Raleigh et al. (US 6,158,041).

**Regarding claims 1-2, 4, 10, 13, and 21**, Christodoulides discloses a method for supporting frame synchronization in a digital communication system (col. 4, lines 16-19), the method comprising the steps of: mapping a codeword specifying framing information of a frame according to a signal constellation to output a data stream (Fig. 5; col. 5, lines 43-48, 56-58); and outputting a physical layer signaling header corresponding to the frame based on the multiplexed

data streams (col. 1, lines 61-67; col. 4, lines 1-6; col. 5, lines 51-52; col. 5, line 66-col. 6, line 10).

Christodoulides doesn't disclose duplicating and demultiplexing the data stream into a first data stream and a second data stream, modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream; and the constellation is independent of a modulation scheme of the frame.

Mowbray teaches demultiplexing the data stream into a first data stream and a second data stream (Fig. 1; col. 3, lines 6-15). However, Mowbray doesn't teach the demultiplexed packets are duplicating packets; modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream.

Miyoshi teaches the demultiplexed packets are duplicating packets, and the constellation (such as BPSK) is independent of a modulation scheme of the frame (Fig. 1, 19; abstract; col. 2, lines 43-67; col. 4, line 56-col. 5, line 6).

Miyoshi doesn't explicitly teach modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream.

Raleigh teaches modifying the first data stream according to a predetermined operation (Fig. 2; col. 4, lines 61-64, illustrates the first data stream is modified by multiplying the value  $i$  by the multiplier 222); multiplexing the modified first data stream with the second data stream (Fig. 2; col. 4, line 65-col. 5, line 1; explains the first data stream modified by multiplier 222 and the second data stream are combined or multiplexed by the summer 224 and the combined output is interleaved by interleaver).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate duplicating and demultiplexing the data stream into a first data stream and a second data stream, and the constellation is independent of a modulation scheme of the frame, modifying the first data stream according to a predetermined operation; multiplexing the modified first data stream with the second data stream as taught by Mowbray, Miyoshi and Raleigh into the satellite communication of Christodoulides in order to improve the speed of higher-capacity networks that require higher-speed and to be able to reconfigure the amount of information which can be transmitted on the channel within the available transmission frames that maximizes message throughput on the channel, capable of improving reception quality without performing transmission and retransmission, and the decoder would not be overwhelmed with successive errors, thus optimize performance and avoid degrading the system.

**Regarding claim 9 and 20**, Christodoulides discloses scrambling the multiplexed data streams (col. 4, lines 3-6).

**Regarding claims 11-12 and 15**, the same rejections to claims 1 and 4 are applicable hereto. The claims are just mere reformulation of claim 1 and 4 in order to define the corresponding computer-readable medium and apparatus.

**Regarding claims 50-51**, Christodoulides discloses the data stream includes a unique word to assist with synchronization (col. 4, lines 16-19).

5. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Mowbray, Miyoshi, and Raleigh, as applied to claims 1 and 12 above, further in view of Mpgre et al. (US 2004/0047433 A1).

Christodoulides discloses a frame format for satellite communication (abstract).

Christodoulides doesn't disclose the frame is a Low Density Parity Check (LDPC) coded frame.

Mogre teaches the frame is a Low Density Parity Check (LDPC) coded frame (paragraph [0018]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use LDPC frame format of Mogre in the modified satellite communication of Christodoulides to efficiently transmit broadband service content using the LDPC that may operate efficiently and effectively using preexisting bandwidth allocated, and avoid attenuation problems when broadcast at preexisting transmission power level.

6. Claims 5-6 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Mowbray, Miyoshi and Raleigh, and further in view of Gardner (US 5,627,499).

The claims include features corresponding to subject matter mentioned above to the rejected claim 1 except a sign of the multiplier represents a portion of the framing information, bits of the first data stream are interleaved with respective additional bits, the additional bits being phase rotated relative to the bits of the first data stream during modulation.

However, Gardner teaches a sign of the multiplier represents a portion of the framing information, bits of the first data stream are interleaved with respective additional bits, the additional bits being phase rotated relative to the bits of the first data stream during modulation (Figs. 2 and 3; col. 4, lines 31-59, illustrates "...the effect of adding multiple 90 degrees to the 8-bit digital representation of the in-phase...bit in the shift register is a logical one, the counter increments the phase by 90 degrees. Alternatively, when the oldest bit in the shift register is a



logical zero, the counter decrements the phase by 90 degrees, and rotating the bits by multiples of 90 degrees).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a sign of the multiplier represents a portion of the framing information, bits of the first data stream are interleaved with respective additional bits, the additional bits being phase rotated relative to the bits of the first data stream during modulation Gardner into the modified satellite communication of Christodoulides in order to be able to reconfigure the amount of information which can be transmitted on the channel within the available transmission frames that maximizes message throughput on the channel, to reduce size and cost of a circuit.

7. Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of Mowbray, Miyoshi, and Raleigh, as applied to claims 1 and 12 above, further in view of Kim et al. (US 6,851,085 B2).

The modified to the satellite communication of Christodoulides discloses generating the codeword or unique word according to turbo or convolutional code. However, Christodoulides doesn't disclose generating the codeword according to a first order Reed-Muller code.

Kim teaches generating the codeword according to a first order Reed-Muller code (col. 2, lines 24-36).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the first order Reed-Muller code to generate codeword as taught by Kim in to the satellite communication of Christodoulides so that a smaller and simplified hardware would be used to generate the codeword at different coding rates, that is, for the input

of different information bits reduces the number of required encoders, simplifies the encoder and decoder structure, and as a consequence, decreases their size.

8. Claims 8 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christodoulides in view of the satellite communication of Mowbray, Miyoshi, and Raleigh, as applied to claims 1 and 12 above, further in view of Love et al. (US 7,158,482 B2).

The modified satellite communication of Christodoulides discloses the framing information. However, the modified satellite communication of Christodoulides doesn't explicitly the framing information specifies a modulation scheme, and a coding scheme.

Love teaches the framing information specifies a modulation scheme, and a coding scheme (Fig. 4; col. 5, lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate framing information or field indicating modulation and coding schemes as taught by Love into the modified satellite communication of Christodoulides in order to improve data throughput of the system, and properly demodulate and decode the data streams.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIBROM T. HAILU whose telephone number is (571)270-1209. The examiner can normally be reached on Monday-Thursday 8:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kibrom T Hailu/

Examiner, Art Unit 2461

/Huy D Vu/

Supervisory Patent Examiner, Art Unit 2461